

CLAIMS

WHAT IS CLAIMED IS:

1. An optical terminator for absorbing high power optical energy traveling in a fiber or waveguide, comprising:
 - 5 a scattering core that receives the high power optical energy;
 - an absorbing layer at least partially surrounding the scattering core to absorb high power optical energy scattered by the scattering core; and
 - a thermal barrier between the scattering core and the surrounding absorbing layer.
- 10 2. The optical terminator of claim 1 further including a heat sink for the absorbing layer.
3. The optical terminator of claim 1 wherein the thermal barrier is an air barrier.
- 15 4. The optical terminator of claim 1 wherein the absorbing layer absorbs optical energy of a broad spectrum of wavelengths.
5. The optical terminator of claim 1 as presented in a connector configuration.
- 20 6. The optical terminator of claim 1 as presented in a plug configuration.
7. The optical terminator of claim 1 as presented in a bare fiber, in line connection configuration.
- 25 8. The optical terminator of claim 1 as presented in a waveguide, in line connection configuration.
9. The optical terminator of claim 1 as presented in an in line configuration with an angled splice connection.

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10. The optical terminator of claim 1 wherein the scattering core comprises a fiber fuse-type core.

11. The optical terminator of claim 1 wherein the scattering core comprises a filled capillary-type core.

12. The optical terminator of claim 1 wherein the scattering core comprises an enlarged-type core.

13. The optical terminator of claim 1 as presented in an in line configuration with a tapered splice connection.

14. The optical terminator of claim 1 wherein the scattering core comprises an enlarged-type core having an angled end.

15. The optical terminator of claim 14 as presented in an in line configuration with an angled splice connection to the enlarged-type core.

16. The optical terminator of claim 1 wherein the scattering core comprises an enlarged-type core with a conical shape.

17. The optical terminator of claim 16 wherein the enlarged-type core with the conical shape is an extended fiber.

18. The optical terminator of claim 1 wherein the absorbing layer includes an angled absorbing face.

19. The optical terminator of claim 1 further including an axial distance adjustment mechanism for selectively choosing an axial distance relationship between the scattering core and the absorbing layer.

20. A method for producing a scattering core, comprising:
emitting high-energy laser light into a large core fiber/waveguide;
flowing the emitted light into a narrowed fiber/waveguide to increase its power per
unit area to a level above a fiber fuse threshold; and
5 impinging the increased power, emitted light on a contaminating deposition which
initiates a fiber fuse backward effect along the narrowed fiber/waveguide to damage the
narrowed fiber/waveguide through the production of bubbles along a core of the narrowed
fiber/waveguide.

10 22. The method of claim 20 wherein the foregoing steps are performed in situ with
respect to the assembly of an optical terminator device.

23. The method of claim 20 wherein the foregoing steps are performed as an
external production method to assembly of an optical terminator device

15 24. A method for producing a scattering core, comprising:
emitting high-energy laser light into a fiber/waveguide at a power per unit area level
above a fiber fuse threshold;
impinging the emitted light on a contaminating deposition which initiates a fiber fuse
20 backward effect along the fiber/waveguide to damage the narrowed fiber/waveguide through
the production of bubbles along a core of the fiber/waveguide; and
reverse splitting energy from the fiber/waveguide to terminate the fiber fuse backward
effect.

25 25. The method of claim 24 wherein the foregoing steps are performed in situ with
respect to the assembly of an optical terminator device.

26. The method of claim 24 wherein the foregoing steps are performed as an
external production method to assembly of an optical terminator device.

27. A method for producing a scattering core, comprising:
drawing a liquid, which shrinks in volume when solidified, into a capillary to
substantially fill its inner volume; and
solidifying the liquid within the capillary to produce bubbles along the inner volume
due to shrinkage in volume.

28. The method of claim 27 wherein the foregoing steps are performed in situ with
respect to the assembly of an optical terminator device.

29. The method of claim 27 wherein the foregoing steps are performed as an
external production method to assembly of an optical terminator device.

30. The method of claim 27 wherein the liquid is glass in liquid form at room
temperature, and solidifying comprises heating the liquid within the capillary.

31. The method of claim 27 wherein the liquid is a polymer primer that when
solidified within the capillary releases adsorbed gases to create the bubbles.

32. An optical terminator, comprising:
a heat sink cap having an internal surface;
an optical absorbing layer on the internal surface of the heat sink cap;
a fiber having a scattering core and a transparent cladding, the fiber being positioned
within the heat sink cap such that a thermal barrier is maintained between the optical
absorbing layer and the cladding of the fiber.

33. The optical terminator of claim 32 further including an axial distance
adjustment mechanism for selectively choosing an axial distance relationship between the
fiber and the optical absorbing layer.

34. The optical terminator of claim 32 wherein the fiber includes a splice for in line connection to another fiber.

35. The optical terminator of claim 34 wherein the splice is an angled splice.

36. The optical terminator of claim 34 wherein the splice is positioned within the heat sink cap.

37. The optical terminator of claim 34 wherein the splice includes a funnel region.

38. The optical terminator of claim 32 wherein the optical absorbing layer on a surface of the heat sink cap adjacent an end of the fiber is angled.

39. The optical terminator of claim 32 wherein the fiber within the heat sink cap has a conical shape.

40. An optical terminator, comprising:
a heat sink cap having an internal surface;
an optical absorbing layer on the internal surface of the heat sink cap;
an enlarged scattering core positioned within the heat sink cap such that a thermal barrier is maintained between the optical absorbing layer and the enlarged scattering core.

41. The optical terminator of claim 40 further including an axial distance adjustment mechanism for selectively choosing an axial distance relationship between the enlarged scattering core and the optical absorbing layer.

42. The optical terminator of claim 40 wherein the enlarged scattering core includes a splice for in line connection to a fiber.

43. The optical terminator of claim 42 wherein the splice is an angled splice.

44. The optical terminator of claim 42 wherein the splice is positioned within the heat sink cap.

45. The optical terminator of claim 40 wherein the enlarged scattering core includes an end adjacent to the heat sink cap which is angled.

46. The optical terminator of claim 40 wherein the optical absorbing layer on a surface of the heat sink cap adjacent an end of the enlarged scattering core is angled.

47. The optical terminator of claim 40 wherein the enlarged scattering core within the heat sink cap has a conical shape.

48. The optical terminator of claim 40 wherein the enlarged scattering core is made of Silica.

49. The optical terminator of claim 40 wherein only a portion of the enlarged scattering core is positioned within the heat sink cap.

50. An optical terminator, comprising:
a heat sink cap having an internal surface;
an optical absorbing layer on the internal surface of the heat sink cap;
a waveguide including a scattering core positioned within the heat sink cap such that a thermal barrier is maintained between the optical absorbing layer and the scattering core of the waveguide.

51. The optical terminator of claim 40 wherein the scattering core includes a splice for in line connection to another waveguide.